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L5 ANSWER 1 OF 7 CAPLUS COPYRIGHT 2009 ACS on STN
AN 2008:1362640 CAPLUS
DN 150:17157
TI Metabolomics of omega-3 polyunsaturated fatty acids and inflammation
AU Isobe, Yosuke; Nakanishi, Hiroki; Taguchi, Ryo; Arita, Makoto
CS Dep. Health Chem., Grad. Sch. Pharm. Sci., The University of Tokyo, Japan
SO Rinsho Kagaku (Nippon Rinsho Kagakkai) (2008), 37(4), 347-353
CODEN: RIKAAN; ISSN: 0370-5633
PB Nippon Rinsho Kagakkai
DT Journal; General Review
LA Japanese
AB A review on system for simultaneous anal. of oxidized fatty acid referring to sample pretreatment by solid phase extraction, identification method for oxidized fatty acid, significance of separation by LC in MRM (multiple reaction monitoring), and quant. determination by internal standard method and its detection limit, creation and property of n-3 polyunsatd. fatty acid synthetase, fat-1, transgenic mouse including resistance to inflammation and to cancer, and metabolome anal. in fat-1 transgenic mouse.

L5 ANSWER 2 OF 7 CAPLUS COPYRIGHT 2009 ACS on STN
AN 2008:1152949 CAPLUS
DN 150:137108
TI Biotechnological methods implemented for improvement of farm animals as a food source with increased unsaturated fatty acids
AU Ostaszewska, Iwona; Sablik, Piotr
CS Katedra Nauk o Zwierzetach Przewijajacych, Wydzial Biotechnologii i Hodowli Zwierzat, Akademia Rolnicza, Szczecin, Pol.
SO Biotechnologia (2008), (3), 153-158
CODEN: BIECEV; ISSN: 0860-7796
PB Instytut Chemii Bioorganicznej PAN
DT Journal; General Review
LA Polish
AB A review. Transgenic animals became easy and open for general use as a source of recombinant proteins and essential components like unsatd. fatty acids. That possibility can completely change the life and health of humans. Thanks to genetic engineering, it is possible to increase the level of healthy fatty acids in animal organism, with the help of e.g. stearyl-CoA desaturase, fat-1 gene. Milk with changed fatty acids composition could be a cure for people with obesity and vascular problems, as also can be an alternative source of long chain polyunsatd. fatty acids for oil-rich fish and fish liver oils. What is more, also natural environment can be saved by those animals.

L5 ANSWER 3 OF 7 CAPLUS COPYRIGHT 2009 ACS on STN
AN 2008:744691 CAPLUS
DN 150:279206
TI A Transgenic Mouse Model for Gene-Nutrient Interactions
AU Kang, Jing X.
CS Department of Medicine, Massachusetts General Hospital and Harvard Medical School, Boston, MA, USA
SO Journal of Nutrigenetics and Nutrigenomics (2008), 1(4), 172-177
CODEN: JNNOBS; ISSN: 1661-6499
PB S. Karger AG
DT Journal; General Review
LA English
AB A review. Diets or nutritional supplements contain many

nutrients and other components that may interact, which adds a layer of complexity to their evaluation. A well-controlled exptl. model that can eliminate or minimize the confounding factors of diet is critical for addressing nutrient-gene interactions. The newly generated fat-1 transgenic mouse was genetically engineered to carry a gene, namely fat-1, from the round worm *Caenorhabditis elegans* and is capable of converting n-6 to n-3 fatty acids (which is naturally impossible in mammals), leading to an increase in n-3 fatty acid content with a balanced n-6/n-3 fatty acid ratio in all tissues, independent of diet. Recent studies using this model indicate that balancing the tissue n-6/n-3 ratio could exert a significant effect on gene expression. The fat-1 mouse model allows carefully controlled studies to be performed in the absence of restricted diets, which can create confounding factors that limit studies of this nature.

RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 4 OF 7 CAPLUS COPYRIGHT 2009 ACS on STN

AN 2006:642807 CAPLUS

DN 146:156537

TI Advances in the studies on *Caenorhabditis elegans* fat-1 gene and its anti-tumor effects

AU Liu, Xiaolei; Ge, Yinlin; Jiang, Zhengyao

CS Department of Physiology, Medical College of Qingdao University, Qingdao, 266021, Peop. Rep. China

SO Yixue Fenzi Shengwuxue Zazhi (2006), 3(2), 118-121

CODEN: YFSZAO; ISSN: 1672-8009

PB Yixue Fenzi Shengwuxue Zazhi Bianjibu

DT Journal; General Review

LA Chinese

AB A review. Fat-1 gene encodes n-3

PUFAs dehydrogenase in *Caenorhabditis elegans*, which mediates dehydrogenation by using n-6 PUFAs as the substrate thereby balances the ratio of n-6 to n-3 PUFAs. In vitro studies showed that the expression of *Caenorhabditis Elegans* fat-1 cDNA can promote the apoptosis of tumor cells, inhibit the proliferation of tumor cells and down-regulate the expression of genes related to the adhesion and metastasis of tumor cells. The exact anti-tumor mechanisms of the gene remain unclear and it may work by changing the ratio of n-6 to n-3 PUFAs, thereby triggering the down-stream anti-tumor mechanisms.

L5 ANSWER 5 OF 7 CAPLUS COPYRIGHT 2009 ACS on STN

AN 2006:120836 CAPLUS

DN 144:348909

TI From fat to fat-1: A tale of omega-3 fatty acids

AU Kang, J. X.

CS Department of Medicine, Massachusetts General Hospital and Harvard Medical School, Boston, MA, 02114, USA

SO Journal of Membrane Biology (2005), 206(2), 165-172

CODEN: JMBBBO; ISSN: 0022-2631

PB Springer

DT Journal; General Review

LA English

AB A review of authors own research. Omega-3 (or n-3) fatty acids

are fats found within foods and body tissues. Aside from being a source of energy production, n-3 acids can act as determinants of the physiochem. properties of cell membranes, thus affecting the physiol. activity and pathol. process through various mechanisms. These fatty acids have cardioprotective, anti-inflammatory, anticancer, and neuroprotective effects, and their anti-arrhythmic action helps prevent sudden cardiac death. The possibility of producing n-3 fatty acids from the n-6 type in

mammalian cells and animals via biotechnol. was investigated. To this end, a converting enzyme gene, fat-1, was transferred from lower species such as plants, microorganisms, and *Caenorhabditis elegans* to mammals. Results show that it is possible to produce foodstuff (for example, meat, milk, and eggs) rich in n-3 fatty acids by generating large fat-1 transgenic animals/livestock such as cows, pigs, sheep, and chickens. This genetic approach is a cost effective and sustainable way of producing n-3 fatty acids that can meet the increasing demand in the future.

RE.CNT 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 6 OF 7 CAPLUS COPYRIGHT 2009 ACS on STN
AN 2005:1245275 CAPLUS
DN 144:35684
TI Balance of omega-6/omega-3 essential fatty acids is important for health: the evidence from gene transfer studies
AU Kang, Jing X.
CS Massachusetts General Hospital and Harvard Medical School, Boston, MA, USA
SO World Review of Nutrition and Dietetics (2005), 95(Nutrition and Fitness: Mental Health, Aging, and the Implementation of a Healthy Diet and Physical Activity Lifestyle), 93-102
CODEN: WRNDAT; ISSN: 0084-2230
PB S. Karger AG
DT Journal; General Review
LA English
AB A review on the author's own work is given concerning the role of the ratio of ω -6- and ω -3 unsatd. fatty acids in transgenic cells and mice. Gene transfer of ω -3 fatty acid desaturase into human cells and mice modifies fatty acid composition and generation of eicosanoids. The effects of cellular production of ω -3 fatty acids on increasing apoptotic death of breast cancer cells, susceptibility of cardiac myocytes to arrhythmia, inhibition of cytokine induction of the inflammatory response in endothelial cells, and protection of cortical neurons from apoptosis are summarized. Transgenic mice show enriched ω -3 fatty acids in their organs and tissues without the need of dietary supply.

RE.CNT 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 7 OF 7 CAPLUS COPYRIGHT 2009 ACS on STN
AN 2003:1014262 CAPLUS
DN 141:70698
TI The importance of omega-6/omega-3 fatty acid ratio in cell function: the gene transfer of omega-3 fatty acid desaturase
AU Kang, Jing X.
CS Massachusetts General Hospital and Harvard Medical School, Boston, MA, USA
SO World Review of Nutrition and Dietetics (2003), 92(Omega-6/Omega-3 Essential Fatty Acid Ratio: The Scientific Evidence), 23-36
CODEN: WRNDAT; ISSN: 0084-2230
PB S. Karger AG
DT Journal; General Review
LA English
AB A review. High fatty acid n-6/n-3 ratio may contribute to the high prevalence of many diseases, such as heart disease and cancer. Balancing or decreasing the ratio may decrease the occurrence of these diseases. At the mol. level, converting the excessive n-6 polyunsatd. fatty acids (PUFA) into n-3 acids may have beneficial effects on cell functions. Mammalian cells naturally cannot convert the n-6 to n-3 PUFA because they lack the gene encoding the converting enzyme n-3 fatty acid desaturase. Such an enzyme exists in *Caenorhabditis elegans* roundworm

nematode. The fat-1 gene encoding the n-3 desaturase has recently been cloned. It is now possible to modify cellular n-6/n-3 ratio by expression of the C. elegans n-3 desaturase in mammalian cells. Virus-mediated gene transfer of the C. elegans n-3 fatty acid desaturase can quickly and dramatically change the cellular n-6/n-3 ratio, alter eicosanoid profiles, and consequently provide beneficial effects of n-3 fatty acids without the need for dietary supplementation with exogenous n-3 fatty acids.

RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

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(FILE 'HOME' ENTERED AT 22:55:40 ON 21 APR 2009)

FILE 'MEDLINE, CAPLUS, BIOSIS, SCISEARCH, LIFESCI' ENTERED AT 22:56:15 ON
21 APR 2009

L1 80 S (DESATURASE OR DESATURAT?) (4A) (N-6 OR N-3) (W)FATTY(W)ACID
L2 35 DUP REM L1 (45 DUPLICATES REMOVED)
L3 135 S (CDNA OR GENE OR POLYNUCLEOTIDE OR DNA) (6A)FAT-1
L4 67 DUP REM L3 (68 DUPLICATES REMOVED)
L5 7 S REVIEW AND L4

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